
GHG Protocol Scope 1 & 2 Calculation Guide

A Practical Introduction to Measuring Your Direct Emissions

Motive ESG

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1. What Are Scope 1 & 2 Emissions?

The GHG Protocol divides emissions into three categories based on where they come from and who controls them.

Scope 1: Direct Emissions You Control

These are emissions from sources your company owns or controls. Think of anything that burns fuel or releases greenhouse gases on your property or from your equipment.

Common examples:

- Natural gas used in your facilities for heating or manufacturing
- Diesel or gasoline in company-owned vehicles and equipment
- Propane, fuel oil, or other fuels burned on-site
- Refrigerants that leak from your HVAC systems
- Process emissions from manufacturing (if applicable)

Scope 2: Indirect Emissions from Purchased Energy

These are emissions from the electricity, steam, heating, or cooling you buy from utility providers. You don't create these emissions directly, but you're responsible for them because you're the customer driving demand.

Common examples:

- Electricity purchased from the grid for your offices, warehouses, or manufacturing facilities
- Purchased steam or chilled water from district systems
- Purchased heating or cooling from third-party providers

Why the Split Matters

The distinction between Scope 1 and 2 isn't academic. Different regulations target different scopes. Your reduction strategies will be different (fuel switching vs. renewable energy purchases). And investors increasingly want to see both numbers separately to understand your operational footprint.

2. Why This Matters

Regulatory Pressure Is Building

California's CARB regulations now require emissions reporting from certain entities. The EU's Corporate Sustainability Reporting Directive (CSRD) mandates detailed climate disclosures. Even without direct regulation, portfolio companies face increasing disclosure requirements from PE firms responding to their own LP demands.

Investors Are Asking

ESG due diligence now includes emissions data. Limited partners want to know the carbon footprint of their investments. Portfolio companies that can't produce Scope 1 and 2 data are becoming harder to exit at premium valuations.

It's Getting Easier to Measure Than to Ignore

The tools exist. The methodologies are standardized. The cost of measurement has dropped dramatically. But the cost of not knowing your numbers keeps rising.

3. The GHG Protocol Approach

The GHG Protocol Corporate Standard is the most widely used framework for emissions accounting. It's what companies reference when they report to CDP, what auditors expect to see, and what regulators use as the foundation for requirements.

Step 1: Set Your Organizational Boundary

Who are you measuring? This sounds simple but gets complicated fast for companies with joint ventures, partially owned subsidiaries, or complex structures.

Two approaches:

- **Equity Share:** You account for emissions based on your ownership percentage
- **Operational Control:** You account for 100% of emissions from operations you control, regardless of ownership

For most portfolio companies, operational control is simpler and more common.

Step 2: Set Your Operational Boundary

What activities are you measuring? For Scope 1 and 2, this means identifying:

- All facilities you operate
- All vehicles and equipment you own
- All energy you purchase

Step 3: Collect Activity Data

This is where the work happens. You need:

- Utility bills showing electricity usage (kWh)
- Fuel purchase records (gallons, therms, liters)
- Vehicle mileage or fuel consumption
- Refrigerant tracking logs (if applicable)

Step 4: Apply Emission Factors

Activity data gets converted to CO₂ equivalent (CO₂e) using emission factors. These factors tell you how many metric tons of CO₂e are produced per unit of

fuel or electricity.

Example: Natural gas produces approximately 0.0053 metric tons CO₂e per therm.

So if you used 10,000 therms of natural gas:

$$10,000 \text{ therms} \times 0.0053 = 53 \text{ metric tons CO}_2\text{e}$$

Step 5: Calculate and Report

Add up your Scope 1 emissions. Add up your Scope 2 emissions. Report them separately in metric tons of CO₂e.

4. Using the Calculator

The Excel calculator included with this guide simplifies the math. Here's how to use it:

Scope 1 Tab:

1. Enter your fuel consumption data in the blue input cells
2. Select the unit of measurement from the dropdown (gallons, therms, kWh, etc.)
3. The calculator applies EPA emission factors automatically
4. Your total Scope 1 emissions appear at the bottom

Scope 2 Tab:

1. Enter electricity consumption by facility or meter
2. Specify the location (state or region) if known - this matters because grid emissions vary by location
3. Choose between location-based (grid average) or market-based (renewable energy credits) methods
4. Total Scope 2 emissions calculate automatically

Results Dashboard:

Visual breakdown of your emissions by source, showing you where to focus reduction efforts.

Important Notes:

- The calculator uses EPA emission factors, which are updated annually
 - For refrigerants, you'll need to know the type and amount leaked (not just purchased)
 - If you have multiple facilities in different states, calculate Scope 2 separately for each location
 - Save a copy of your completed calculator - you'll need it for year-over-year comparisons
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5. Common Challenges

"We Don't Have All the Data"

This is the most common problem. Missing utility bills, incomplete vehicle logs, facilities where the landlord pays utilities. Welcome to ESG data management.

Solutions:

- Start with what you have and document gaps
- Use estimates for missing data but label them clearly
- Set up systems now to capture complete data going forward
- Consider this your baseline year and improve data quality next cycle

"Our Landlord Pays the Utilities"

For leased spaces, you might not receive electricity bills directly. Options:

- Request consumption data from the landlord
- Use square footage and building averages
- Install submeters (for larger facilities)
- Estimate based on similar facilities you do control

"Which Emission Factor Do I Use?"

EPA provides standard factors that work for most situations. Use the most recent factors available. For electricity, use eGRID subregion factors if you know your facility's location.

When in doubt, document which factor you used and why. Consistency matters more than perfection in your first baseline year.

"Our Operations Span Multiple States/Countries"

Calculate separately by location, especially for Scope 2. Grid emissions in California are different from those in Texas or Kentucky. The calculator includes location-based factors.

"We Have Unusual Sources"

Manufacturing process emissions, specialized equipment, or unusual fuel types might not fit neatly into the calculator. That's when you need custom emission factors and more sophisticated accounting.

This is also a good time to call in expertise.

6. Next Steps

Congratulations. You now understand the basics of Scope 1 and 2 emissions accounting under the GHG Protocol. You might even have calculated your baseline.

But here's what this simplified guide doesn't cover:

- Third-party verification and assurance
- Scope 2 market-based accounting with RECs and PPAs
- Complex operational boundaries (joint ventures, minority investments)
- Portfolio-wide roll-up reporting with data quality controls
- Year-over-year tracking with adjustments for acquisitions or divestitures
- Emissions reduction target setting aligned with science-based methods
- Regulatory reporting requirements (CARB, EU CSRD, etc.)
- Integration with financial metrics and enterprise value

When to Call Motive ESG:

You should handle your own Scope 1 and 2 baseline if:

- You have straightforward operations (offices, basic facilities)
- Complete data access
- No regulatory reporting requirements yet

- Time to learn the methodology

You should call us if:

- You're preparing for investor due diligence or exit
- You need verified or assured emissions data
- You're managing a portfolio of companies
- You face regulatory reporting requirements
- You need reduction strategies, not just measurement
- Your operations are complex (manufacturing, multinational, JVs)
- You want this done right the first time

Ready to go deeper?

Motive ESG provides comprehensive GHG accounting, portfolio roll-up reporting, regulatory compliance support, and strategic emissions reduction planning.

Contact Motive ESG

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